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Institut für Biologie, Humboldt Universität, Berlin, Germany.

The gene encoding extracellular xylanase (xynA) was amplified as a 770 bp DNA fragment from *Bacillus subtilis* 168 chromosomal DNA by PCR. The genes encoding endo-beta-1,4-glucanase (eglS) and endo-beta-1,3-1,4-glucanase (bglS) were isolated from a genomic library of *B. subtilis* 168. The sequences of xynA and eglS were identical to those of the xylanase and cellulase genes from *B. subtilis* PAP115. Integrative plasmids containing DNA fragments with deletions in the coding region of the genes were constructed and used to replace the chromosomal eglS, bglS and xynA genes of *B. subtilis* 168. Strains without any detectable activity against xylan (Xyn-), carboxymethylcellulose (Egl-) or mixed linked beta-1,3-1,4-glucan (Egl- Bgl-) were obtained. The genes were mapped at 170 degrees (eglS), 175 degrees (xynA) and 340 degrees (bglS) on the *B. subtilis* chromosome.

PMID: 7704256 [PubMed - indexed for MEDLINE]

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Feb 24 2006 04:49:50